BOOKS: OCEANOGRAPHY

Song for an Ocean Planet

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Twenty-five years of scientific sounding of the sea have revealed that in ways too numerous to count, too profound to measure fully, Atlantic's great waters are life-giving. For we who have finished the work of Adam and Eve, who have toiled in the wilderness and reclaimed it, who have subdued earth and come to rule over the fish and fowl, it is time to recognize this gift for the bounty it brings and to seek, in our thoughts, words, and deeds, to return it in full measure.

So ends science writer Deborah Cramer's compelling account of the myriad and intricate ways that the waters of Atlantic, her allegorical Every-ocean, are the wellspring for life on Earth. *Great Waters* is far from an environmental activist's manifesto. The author does not denounce wasteful practices of modern society or attempt to scare us with doomsday scenarios. Rather, she more aptly follows the guidance of Rachel Carson: "The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction" (*1*).

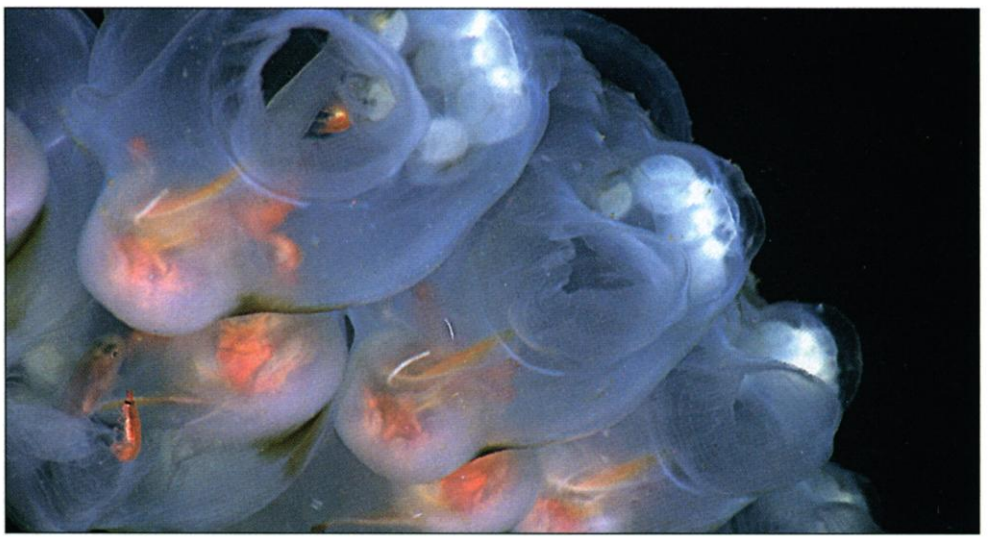
Under the pretense of recounting her musings during a voyage on the sailing research vessel *Corwith Cramer* "(no relation)," Cramer artfully weaves the tales of such fascinating discoveries as the chemotrophic communities surrounding deep-sea hot springs and the alien world of the midwater, inhabited by soft-bodied drifters spectacularly adapted to scavenging for leftover nutrition in perpetual darkness. In fewer than 400 printed pages, the reader is introduced to a host of hot topics: the decline in commercial fisheries, the demise of coral reefs, the ocean's role in climate change, invasive species, the ocean carbon cycle, iron fertilization of the oceans, harmful algal blooms, destruction of benthic habitat, coastal pollution and erosion, and many others. All of these issues are placed within their long-term, geologic context in order to provide a yardstick for gauging human impact. For example, species diversity is a function of the distribution of land and sea, a pattern that has changed over the eons as supercontinents have dispersed and re-amalgamated. Ships, canals, and other human devices are now the vectors for introducing species across geographic barriers, but those barriers are impermanent. We are simply accelerating the rate of environmental changes that this planet has endured before. Without passing judgment, Cramer implicitly asks whether we are willing to accept the consequences.

Great Waters
An Atlantic Passage
by Deborah Cramer
Norton, New York, 2001. 442 pp. $27.95, C$39.99. ISBN 0-393-02019-3.

I was impressed with the level of scholarship evident in the author's research. She typically relied on original sources, and the book is absolutely up to date—even including such recent blockbusters as the discovery of new kind of phototrophy employed by common bacteria in the upper ocean [O. Béjà *et al.*, *Science* **289**, 1902 (2000)]. Either through inside sources or some divine inspiration, Cramer was able to anticipate the outcome of experiments underway at the time of publication, such as the confirmation through satellite tagging that eastern and western Atlantic tuna are not separate populations [B. Block *et al.*, *Science* **293**, 1310 (2001)]. For the nonspecialist, her prose conveys the essence of the issues without the specialist jargon and mind-numbing details intrinsic to the real science.

The book disappointed me on only a few counts. I lament the dearth of illustrations. Granted, the author is masterful at painting pictures with her words, but even her prose cannot do justice to the beauty of the deep-sea realm. Cramer describes "ribbony chains of barrel-shaped salps. Watery, transparent, insubstantial...they need no skeleton to carry or brace themselves, no protective coloring to block the sun's damaging ultraviolet light." Included here is a photo of such a ribbony chain; indeed, the picture paints a thousand words. In addition, all measures in the book are first expressed in English units and then repeated in metric, but the conversions were not always done correctly—9° Fahrenheit is not 16° Celsius.

Such minor flaws do not detract from Cramer's central message: the ocean sustains us, and its health and our health are irreversibly intertwined. I will recommend *Great Waters* to engineers attracted to my oceanographic institute from other industries, engineers who thus lack the inside understanding of why we are so passionate about the importance and urgency of our mission. I will recommend it to that fellow parent I encountered recently in the school parking lot, a successful businessman who expressed the opinion that it was sheer hubris to think that beings as tiny as humans could be having a noticeable effect on oceans and climate. I will recommend it to anyone who proposes to be an informed citizen of planet Earth.



Salps at sea. Like other salps, these *Thetys vagina* pump water through their barrel-shaped bodies for filter feeding and propulsion. Such planktonic tunicates can provide a floating habitat for large numbers of amphipods and small fish.

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References and Notes

1. The words are Carson's from her 1954 essay "The Real World Around Us," which is reprinted in L. Lear, Ed., *Lost Woods: The Discovered Writing of Rachel Carson* (Beacon, Boston, 1998).